

REMARKS

Claims 1-5 are pending in the application.

Claims 1-5 are rejected.

Claims 1, 3, 4 and 5 are rejected under 35 U.S.C. 103(a).

Claim 2 is rejected under 35 U.S.C. 103(a).

Claims 1 and 3 are rejected under 35 U.S.C. 103(a).

Claim 2 is rejected under 35 U.S.C. 103(a).

Claim 1 stands amended.

Claims 6-10 are added. No new matter is added.

Claims 1-10 remain in the case for consideration.

Applicant requests reconsideration and allowance of the claims in light of the above amendments and following remarks.

Examiner Interview Summary

On June 30, 2005, the applicant conducted a telephonic interview with the Examiner regarding proposed amendments to independent claim 1. It was proposed to amend claim 1 to recite that the metallic layer is formed on the backside of the semiconductor chip. The applicant explained that the prior art cited thus far only included a metallic layer with an adhesive interposed between the metallic layer and the semiconductor chip. The Examiner agreed that the prior art cited thus far did not disclose a metallic layer formed on the back side of the semiconductor chip.

Claim Rejections - 35 USC § 103

Claims 1, 3, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fisher (U.S. 5,936,758) in combination with Mullen (U.S. 5,241,133).

With respect to amended independent claim 1, the claim is amended to recite that the semiconductor chip includes a metallic layer formed on a back surface of the chip and that the semiconductor chip is attached to the top surface of the substrate with a metallic adhesive adhering to the metallic layer.

Mullen is cited as having a copper metallic layer disposed between the chip and an adhesive. However, as shown in FIG. 6 of Mullen and explained at column 4, lines 39-41, the metal stiffener 60 is attached to the chip 64 using a conductive adhesive 67. Thus, an

adhesive layer is interposed between the metal stiffener 60 and the chip 64 because the metal stiffener 60 is not formed on the chip 64.

Therefore, the combination of Fisher and Mullen fails to disclose each and every element of amended independent claim 1. Thus, claim 1 is believed to be allowable over the combination of Fisher and Mullen and allowance is respectfully requested.

Claims 3-5 depend from amended independent claim 1 and for at least the reasons given for claim 1, these claims are also believed to be allowable over the combination of Fisher and Mullen and allowance is respectfully requested.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fisher (U.S. 5,936,758) and Mullen (U.S. 5,241,133) as applied to claim 1 and further in combination with Akram (U.S. 2001/004564).

Claim 2 depends from amended independent claim 1 and, thus, necessarily includes all of the limitations of claim 1. The addition of Akram does not cure the deficiencies of Fisher and Mullen with respect to claim 1. Thus, claim 2 is believed to be allowable over the combination of Fisher, Mullen and Akram and allowance is respectfully requested.

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coyle (U.S. 2001/0034083) in combination with Ommen, et al. (U.S. 5,397,917).

As described above, claim 1 is amended to recite that the semiconductor chip includes a metallic layer formed on a back surface of the chip and that the semiconductor chip is attached to the top surface of the substrate with a metallic adhesive adhering to the metallic layer.

Ommen is cited for disclosing a copper metallic layer disposed between the semiconductor chip and a metallic adhesive. However, FIG. 1 of Ommen shows that the metallic heat spreader 11 is not formed on the back surface of the chip 25. As explained at column 4, lines 52-54, the semiconductor chip 25 is "mounted to the heat spreader 11 by a conventional die attach material 22 such as silver filled epoxy." Thus, just as in Mullen, an adhesive is interposed between the chip and the metallic heat spreader.

Therefore, the combination of Coyle and Ommen fails to disclose each and every element of amended independent claim 1. Thus, claim 1 is believed to be allowable over the combination of Coyle and Ommen and allowance is respectfully requested.

Claim 3 depends from claim 1 and for at least the reasons given for claim 1, this claim is believed to be allowable over the combination of Coyle and Ommen and allowance is respectfully requested.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coyle (U.S. 2001/0034083) and Ommen, et al. (U.S. 5,397,917) as applied to claim 1 and further in combination with Gondunsky, et al. (U.S. 5,050,040).

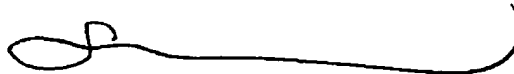
Claim 2 depends from amended independent claim 1 and, thus, necessarily includes all of the limitations of claim 1. The addition of Gondunsky does not cure the deficiencies of Coyle and Mullen with respect to claim 1. Thus, claim 2 is believed to be allowable over the combination of Coyle, Ommen and Gondunsky and allowance is respectfully requested.

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-5 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.



Hosoon Lee
Reg. No. 56,737

MARGER JOHNSON & McCOLLOM, P.C.
210 SW Morrison Street, Suite 400
Portland, OR 97204
503-222-3613
Customer No. 20575

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Stormi R. Davis